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EXAMINER	
LE, LANA N	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/762,455	TSENG ET AL.	
	Examiner	Art Unit	
	Lana N. Le	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Marz (US 4,979,230).

Regarding claim 1, Marz discloses a method for frequency conversion in a receiver, comprising the steps of:

receiving a signal having a radio frequency (incoming signal, i.e. cable television frequencies in the MHz range of wide frequency spectrum, and carrying information on a plurality of channels (col 4, lines 10-28);

selecting one of the channels (any selected TV channel);

converting the signal (via 56, 58; fig. 3 and hereafter) from the radio frequency to a first variable frequency (frequency higher than frequency of incoming signal) determined by the selected channel (col 4, lines 10-12, lines 17-28); and

converting the signal (upconverted channel signal) (via 64, 66, 68, 70) from the first frequency to a second frequency (col 4, lines 37-56).

Regarding claim 2, Marz discloses the method as claimed in claim 1, wherein Marz discloses the first frequency is determined so that noise coupled from the other channels into the selected channel is inherently minimized as an intended purpose.

Regarding claim 3, Marz discloses the method as claimed in claim 1, wherein the first frequency (higher upconverted frequency via 56) is higher than the radio frequency (incoming signal) (col 4, lines 10-12).

Regarding claim 4, Marz discloses the method as claimed in claim 1, wherein the second frequency is fixed for all the channels (due to fixed local oscillator 70).

Regarding claim 5, Marz discloses the method as claimed in claim 1, wherein the second frequency is a baseband frequency (baseband signal at DSP 72).

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> **A person shall be entitled to a patent unless –**
>
> **(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.**

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Birleson (US 6,714,776).

Regarding claim 13, Birelson discloses a receiver (fig. 1) comprising:

an antenna (102) receiving an RF signal carrying information on a plurality of channels (col 4, lines 33-36);

a first local oscillator (142) generating a first oscillating signal having a first frequency (col 2, lines 18-21);

a first mixer (108) mixing the RF signal with the first oscillating signal to generate an intermediate signal (intermediate signal) (col);

a second local oscillator (LO not shown connected to output of filter 124) generating a second oscillating signal having a second frequency (col 5, lines 33-44) and

a second mixer (122, 150) mixing the intermediate signal with the second oscillating signal to generate a baseband signal (col 5, lines 36-44; col 6, lines 13-16);

wherein a frequency of the intermediate signal is variable and determined by the selected channel (tuner tune to selected channel by a tuning signal used by VCO in frequency synthesizer 142; col 5, lines 1-15).

Regarding claim 14, Birleson discloses the receiver as claimed in claim 13, wherein the frequency of the intermediate signal is determined so that noise coupled from the other channels into the selected channel is inherently minimized as an intended purpose when the variable oscillator is set according to the selected channel.

5. Claims 20-21 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Rotzoll (US 5,737,035).

Regarding claim 20, Rotzoll discloses a receiver (fig. 4) comprising:

an antenna (402; fig. 4) receiving an RF signal carrying information in a plurality of channels (col 8, lines 38-40);

a first local oscillator (450) generating a first oscillating signal having a first frequency (col 8, lines 51-55);

a first mixer (MIX1 408) mixing the RF signal with the first oscillating signal to generate a first intermediate signal (intermediate signal) (col 8, lines 51-55);

a second local oscillator (oscillator 412) generating a second oscillating signal having a second frequency (col 9, lines 62-66);

a second mixer (MIX2 410) mixing the first intermediate signal with the second oscillating signal to generate a second intermediate signal (col 9, lines 62-66);

a third local oscillator (inherent oscillator connected to output of VCEF 425 through limiter 428) generating a third oscillating signal having a third frequency (col 10, lines 54-65; col 18, lines 25-31); and

a third mixer (AQD 462, VDET 426) mixing the second intermediate signal with the third oscillating signal to generate a baseband signal (col 10, lines 54-65; col 14, line 64–col 15, line 26);

wherein a frequency of the first intermediate signal is variable and determined by the selected channel (desired channel selected by user, i.e. channel 2, col 8, lines 49-51; col 9, lines 37-42 and variable oscillator of synthesizer 450 which varies from

1200MHz to 2100MHz is tuned and set according to the channel selected; col 18, lines 45-67).

Regarding claim 21, Rotzoll discloses the receiver as claimed in claim 20, wherein the frequency of the first intermediate signal is determined so that noise coupled from the other channels into the selected channel is inherently minimized.

Regarding claim 24, Rotzoll discloses the receiver as claimed in claim 20 further comprising a low noise amplifier (406) coupled between the antenna and the first mixer to amplify the RF signal.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson (US 6,714,776).

Regarding claim 17, Birleson discloses the receiver as claimed in claim 13 further comprising a RF amplifier (12) coupled between the antenna and the first mixer to amplify the RF signal. Birleson does not disclose a low noise amplifier. However, the examiner takes official notice that the RF amplifier can be a low noise amplifier.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a low noise amplifier in order to reduce noise in the amplication of the received RF signal of Birelson.

8. Claims 6-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marz (US 4,979,230) in view of Rotzoll (US 5,737,035).

Regarding claim 6, Marz discloses the method as claimed in claim 1 wherein Marz does not disclose the method further comprising the step of converting the signal from the second frequency to a third frequency. Rotzoll discloses a method of converting a signal from a second frequency (second frequency downconverted at MIX1 408 to another IF frequency) to a third frequency (frequency at output of MIX2 410) wherein the second and third frequencies are intermediate frequencies; col 9, line 20 - col 10, line 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to convert to another intermediate frequency in order to reject undesired image frequencies or signal energy in the second IF frequency as suggested by Rotzoll (col 10, line 6-25).

Regarding claim 7, Marz and Rotzoll disclose the method as claimed in claim 6, wherein Marz discloses the first frequency is determined to inherently minimize noise coupled from the other channels into the selected channel as an intended purpose.

Regarding claim 8, Marz and Rotzoll disclose the method as claimed in claim 6, wherein Marz discloses the first frequency (higher upconverted frequency) is higher than the radio frequency (incoming signal) (col 4, lines 10-12).

Regarding claim 9, Marz and Rotzoll disclose the method as claimed in claim 6, wherein Marz discloses the second frequency is fixed (due to fixed oscillator 70) for all the channels.

Regarding claim 10, Marz and Rotzoll disclose the method as claimed in claim 6, wherein Marz discloses the second frequency is lower than the first frequency (baseband frequency output at DSP 72).

Regarding claim 11, Marz and Rotzoll disclose the method as claimed in claim 6, wherein Marz and Rotzoll do not disclose the third frequency (baseband frequency output) is fixed for all the channels. However, it is notoriously old and well known for the third frequency to be fixed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the third oscillator and mixer be fixed in order to convert without any further need for channel selection the already selected channel of the modified method of Marz and Rotzoll to baseband frequency (col 14, line 64 - col 15, line 15).

Regarding claim 12, Marz and Rotzoll disclose the method as claimed in claim 6, wherein the third frequency is a baseband frequency (baseband video and audio output) (col 14, line 64 - col 15, line 15).

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson (US 6,714,776) in view of Dobrovolny (US 2005/0,054,314).

Regarding claim 18, Birleson discloses the receiver as claimed in claim 13 wherein Birleson does not disclose the receiver further comprises a SAW driver coupled

to an output of the second mixer. Dobrovolny discloses the receiver further comprises a SAW driver (215; fig. 4) coupled to an output of a mixer (208) (para. 32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a SAW driver in order to drive the SAW filter 216.

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson (US 6,714,776) in view of Bult et al (US 6,879,816).

Regarding claim 19, Birelson discloses the receiver as claimed in claim 13, wherein Birelson does not disclose the first and second mixers are image rejection mixers. Bult et al disclose the first and second mixers are image rejection mixers (IR Reject mixers; fig. 53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the mixers be image reject mixers in order to suppress the unwanted image frequencies.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson (US 6,714,776) in view of Cho (US 6,137,368) and further in view of Marz (US 5,390,346).

Regarding claim 15, Birelson discloses the receiver as claimed in claim 13, wherein Birelson does not disclose the first oscillator comprises a first frequency divider dividing a frequency FR of a reference signal by a divisor N; a phase frequency detector having a first input coupled to an output of the first frequency divider;

a charge pump having an input coupled to an output of the phase frequency detector; a loop filter having an input coupled to an output of the charge pump;
a voltage controlled oscillator having an input coupled to an output of the loop filter;

a second frequency divider dividing a frequency of a signal output from the voltage controlled oscillator by a divisor P and outputting the first oscillating signal; and

a frequency multiplier multiplying the first oscillating signal by a multiplicator M and having an output coupled to a second input of the phase frequency detector.

Cho discloses a first synthesizer (1; fig. 2) comprising a first frequency divider (100) dividing a frequency FR of a reference signal by a divisor (M); a phase frequency detector (300) having a first input (30) coupled to an output of the first frequency divider (100); a charge pump (400) having an input (50) coupled to an output of the phase frequency detector (300); a loop filter (500) having an input (60) coupled to an output of the charge pump (400);

a voltage controlled oscillator (600) having an input (70) coupled to an output of the loop filter (500); a second frequency divider (700) dividing a frequency of a signal output (20) from the voltage controlled oscillator (600) by a divisor (P) and outputting the first oscillating signal (30); and a frequency divider (200) dividing the first oscillating signal by a divisor N and having an output coupled to a second input (40) of the phase frequency detector (300). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have an oscillator having a phase locked loop in the oscillator of Birelson in order to allow the PLL characteristics to remain unchanged as suggested by Cho. Birelson and Cho do not disclose a frequency multiplier multiplying the first oscillating signal by a multiplicator M. However, it is notoriously old and well known for the divider to be a multiplier/prescaler as taught by Marz. Marz discloses a PLL having a prescaler (40) (col 8, lines 20-25). It would have been obvious

to one of ordinary skill in the art at the time the invention was made to have a multiplier in order to scale the first oscillating signal by a multiplication factor.

12. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson (US 6,714,776) in view of Cho (US 6,137,368) in view of Marz (US 5,390,346) and further in view of Aoyama et al (US 5,517,685).

Regarding claim 16, Birelson, Cho and Marz disclose the receiver as claimed in claim 15, wherein Birelson, Cho and Marz do not disclose the divisors N and P, and the multiplicator M are determined by the selected channel. However, it is well known and notoriously old in the art to have the divisors and multiplicator be determined by the selected channel as taught by Aoyama et al. Aoyama et al disclose the divisors and factors (of divider and prescaler 85, 84) are determined by the selected channels (see fig. 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the divisors and prescalers of Cho and Marz be determined by the selected channels in order to adjust the phase locked loop circuit by changing the divisor and factor according to the particular channel selected as suggested by Aoyama et al.

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rotzoll (US 5,737,035) in view of Cho (US 6,137,368) and further in view of Marz (US 5,390,346).

Regarding claim 22, Rotzoll discloses the receiver as claimed in claim 20, wherein Rotzoll does not disclose each of the first and second oscillator comprises:

a first frequency divider dividing a frequency FR of a reference signal

by a divisor N; a phase frequency detector having a first input coupled to an output of the first frequency divider; a charge pump having an input coupled to an output of the phase frequency detector;

a loop filter having an input coupled to an output of the charge pump; a voltage controlled oscillator having an input coupled to an output of the loop filter; a second frequency divider dividing a frequency of a signal output from the voltage controlled oscillator by a divisor P and outputting the first oscillating signal; and a frequency multiplier multiplying the first oscillating signal by a multiplicator M and having an output coupled to a second input of the phase frequency detector.

Cho discloses a first synthesizer (1; fig. 2) comprising a first frequency divider (100) dividing a frequency FR of a reference signal by a divisor (M); a phase frequency detector (300) having a first input (30) coupled to an output of the first frequency divider (100); a charge pump (400) having an input (50) coupled to an output of the phase frequency detector (300);

a loop filter (500) having an input (60) coupled to an output of the charge pump (400); a voltage controlled oscillator (600) having an input (70) coupled to an output of the loop filter (500); a second frequency divider (700) dividing a frequency of a signal output (20) from the voltage controlled oscillator (600) by a divisor (P) and outputting the first oscillating signal (30); and a frequency divider (200) dividing the first oscillating signal by a divisor N and having an output coupled to a second input (40) of the phase frequency detector (300). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have an oscillator having a phase locked loop in

the oscillator of Rotzoll in order to allow the PLL characteristics to remain unchanged as suggested by Cho. Birelson and Cho do not disclose a frequency multiplier multiplying the first oscillating signal by a multiplicator M. However, it is notoriously old and well known for the divider to be a multiplier/prescaler as taught by Marz. Marz discloses a PLL having a prescaler (40) (col 8, lines 20-25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the divider of Cho with the multiplier of Marz in order to scale the first oscillating signal by a multiplication factor.

14. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rotzoll (US 5,737,035) in view of Cho (US 6,137,368) in view of Marz (US 5,390,346) and further in view of Aoyama et al (US 5,517,685).

Regarding claim 23, Rotzoll, Cho and Marz disclose the receiver as claimed in claim 22, wherein Birelson, Cho and Marz do not disclose the divisors N and P, and the multiplicator M are determined by the selected channel. However, it is well known and notoriously old in the art to have the divisors and multiplicator be determined by the selected channel as taught by Aoyama et al. Aoyama et al disclose the divisors and factors (of divider and prescaler 85, 84) are determined by the selected channels (see fig. 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the divisors and prescalers of Cho and Marz be determined by the selected channels in order to adjust the phase locked loop circuit by changing the divisor and factor according to the particular channel selected as suggested by Aoyama et al.

15. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rotzoll (US 5,737,035) in view of Dobrovolny (US (US 2005/0,054,314).

Regarding claim 25, Rotzoll discloses the receiver as claimed in claim 20 wherein Rotzoll does not disclose the receiver further comprises a SAW driver coupled to an output of the third mixer. Dobrovolny discloses the receiver further comprises a SAW driver (215; fig. 4) coupled to an output of a mixer (208) (para. 32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a SAW driver coupled to the ouput of the third mixer of Rotzoll in order to drive a SAW filter.

16. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rotzoll (US 5,737,035) in view of Bult et al (US 6,879,816).

Regarding claim 26, Rotzoll discloses the receiver as claimed in claim 20, wherein Rotzoll disclose the second mixer (410) is an image rejection mixer. Rotzoll does not disclose the first, second, and third mixers are image rejection mixers. Bult et al disclose mixers that are image rejection mixers (IR Reject mixers; fig. 53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the mixers be image reject mixers in order to allow the TV tuner to suppress the unwanted image frequencies.

Response to Arguments

17. Applicant's arguments filed 9/19/06 have been fully considered but they are not persuasive.

Regarding claims 1 and 20, applicant states the cited reference, Marz, discloses a fixed intermediate frequency. The examiner respectfully disagrees. With regards to the intermediate frequency produced, the local oscillator is tunable over the entire CATV band based on a selected channel to produce an intermediate frequency in a second band above the first band which the received signal is in (see col 4, lines 1-28; abstract). Therefore, the 2GHz intermediate frequency is only an example of a desired intermediate frequency and the invention of Marz is not limited to this frequency since the intermediate frequency is variable based on the chosen tuned frequency from the local oscillator.

Regarding claim 6, applicant's amendment have been considered but are moot in view of the new ground(s) of rejection. Applicant's remarks also argue the cited reference, Rotzoll converts the received RF signal to a fixed frequency. However, the tunable local oscillator 450 is tuned based on the selected channel which allows the frequency of the intermediate frequency to be variable based therefrom.

Regarding claim 13, applicant again states the intermediate frequency is fixed. However, the cited reference, Birleson, also discloses a tunable synthesizer 142. Therefore, the intermediate frequency cannot just be a fixed frequency, but variable based on the selected tuned frequency from the synthesizer.

As a result, the office action filed 4/21/06 stands rejected as set forth in the previous office action with new grounds of rejection for the amended claim.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N. Le whose telephone number is (571) 272-7891. The examiner can normally be reached on M-F 9:30-18:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lana Le

11-17-06

LANA LE
PRIMARY EXAMINER